Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of

Wireless Broadband Access	)	GN Docket No. 04-163

COMMENTS OF IPWIRELESS, INC.

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SUMMARY

IPWireless, a U.S. company and the first developer to complete successful commercial deployment of standards-based true broadband[1] wireless access in fixed, mobile and portable applications, appreciates the opportunity to present its views to the Commission and the Wireless Broadband Access Task Force. IPWireless expects that, by the end of 2004, its UMTS TDD technology will be deployed in more than a dozen countries with a total population of more than 340 million. This technology has been shown to be fully capable of competing head-to-head with wired broadband. In New Zealand, where Woosh Wireless first commercially launched the IPWireless technology, it is gaining 40-60% of new subscribers in its coverage area, against a strong incumbent DSL offering.

IPWireless is eager to see its technology commercially deployed in the United States, providing a "third pipe" broadband access alternative to DSL and cable modems to homes and businesses in urban, suburban and rural areas. The principal obstacle to the successful launch of IPWireless technology in the United States is the near-total lack of usable spectrum for the provision of TDD-based fixed, mobile and portable services.

In these initial comments, IPWireless offers a series of five specific recommendations for consideration by the Task Force and the Commission. IPWireless urges the Commission to consider carefully the need for a spectrum policy that strikes a more appropriate balance between paired and unpaired spectrum and between licensed and unlicensed use, and looks forward to working with the Task Force and the Commission toward realizing the vision of ubiquitous and affordable wireless broadband access.

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[1] IPWireless has demonstrated the capability to provide "true broadband wireless access" -- average sector data throughput at data rates substantially greater than 1 Mbps on the downlink and in excess of 500 kbps on the uplink; the global UMTS TDD standard supports mobility at speeds up to 120 km/hr.

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IPWireless, Inc. ("IPWireless" or "IPW") respectfully submits these initial comments to the Commission's Wireless Broadband Access Task Force ("Task Force"). IPWireless welcomes the opportunity afforded by the Commission and the Task Force to comment on various aspects of wireless broadband access. IPWireless is in particular agreement with the following statement on page 3 of the Public Notice: "Wireless broadband offers clear advantages over other broadband alternatives in terms of both portability and mobility." Moreover, IPWireless believes that licensed wireless broadband conforming to the internationally recognized UMTS TDD standard (also known as TD-CDMA) offers other major advantages for consumers and operators, including lower cost per subscriber, the ability to deploy service in rural areas, support for international roaming, speed of deployment and ease of deployment.

As a founding member of the Global UMTS TDD Alliance ("Alliance"), IPWireless supports the views expressed by the Alliance in comments being filed today. In these separate comments, IPWireless seeks to elaborate upon some of the particular advantages of UMTS TDD and provide its additional views in response to some of the specific questions posed by the Task Force.

INTRODUCTION

IPW was founded in early 1999 with the goal of providing wireless broadband access technology providing high speed data,[2] high capacity (*i.e*. mass market), low cost, low latency for voice, and supporting mobile, portable and fixed applications. At the time of its founding IPWireless reviewed all existing and planned wireless technologies for wireless broadband access. These included Orthogonal Frequency Division Multiplexing ("OFDM"), W-CDMA (FDD) and UMTS TDD. IPW selected UMTS TDD (also known as TD-CDMA) because:

- UMTS TDD supports fixed, portable and mobile data rates at or above typical DSL and cable modem offerings, essential for broadband wireless operators to compete effectively with DSL and cable.[3]
- UMTS TDD has lower basic costs than other high data rate wireless technologies such as OFDM, because it shares components with another major world standard, W-CDMA (the FDD variant of UMTS), resulting in large cost savings from volume production of components.
- UMTS TDD, as an international standard, supports global roaming. In most developed countries including all of Europe and most recently Japan, China and Korea specific frequency has been set-aside on which UMTS TDD can operate.
- UMTS TDD was the first international standard developed that meets the need for a ubiquitous, very high data rate, low latency, packet based platform to provide wireless broadband to users at home, at work or on the road. The standard was first defined in 1999 by the 3rd Generation Project Partnership (3GPP), and the standard continues to evolve and move forward based on input from operators and vendors.

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[2] T1 (1.5 Mbps) data rates and above, in contrast to the 90 kbps or 384 kbps "broadband" offerings of some licensed mobile service providers.

[3] IPW defines high data rate broadband wireless as having an average downstream rate of at least 1 Mbps and an average upstream rate of at least 500 kbps in fixed, mobile and portable applications. Reference herein to "high data rate" broadband will refer to these data rates. Many technologies which claim to supply wireless broadband, or high data rate wireless broadband, may provide data rates higher than traditional dial-up modems but do not achieve the objective of data rates equal to or better than DSL and cable modems. Success in today's competitive market for broadband access is dependent on several factors, including data rate and price (as is evidenced by the current competition between cable modems and DSL). In the absence of data rates at least as great as those of typical DSL and cable modem services, wireless broadband access services will not be fully competitive over the long term.

- UMTS TDD supports the asymmetric nature of interactive data transmission in a far more frequency efficient manner than paired-spectrum technologies such as W-CDMA (FDD).
- UMTS TDD supports very high capacity and high spectral efficiency. In 5MHz of spectrum, IPW has demonstrated a fully mobile modem with a data rate of 5 MBPS downstream and 1 Mbps upstream.
- UMTS TDD can be deployed to serve rural areas with receive sites (subscriber CPE) as far as 18 miles from the transmit site, or can be deployed in dense urban environments with excellent in-building penetration, over a 1-3 mile radius, thereby facilitating the shared use of existing cellular or PCS tower sites.
- UMTS TDD supports low latency voice over IP ("VoIP"), allowing it to be an excellent platform for combined voice and high data rate service.

From its founding in 1999, IPWireless moved to quickly commercialize TDD 3G. In the summer of 2000 IPWireless conducted what it believes to have been the first wide-area high data rate wireless broadband trial in the world. The trial was conducted in Greensboro, North Carolina, and involved transmissions to users of IPW user equipment (UE), or wireless modems, across large areas of the city, at a data rate of up to 3 Mbps. A number of Commission staff visited the IPW Greensboro site and witnessed the system in operation at that time.

The IPW UMTS TDD product became commercial in 2001. Since that time, it has been deployed internationally in a number of commercial and trial systems. Among announced deployments are:

- A national network in Germany.
- A national network in the U.K.
- A national network in Malaysia.
- A national network in Portugal.
- A national network in New Zealand.
- A national network in South Africa.
- Regional networks in Australia.

Unannounced deployments include national networks in two of the largest countries in Europe. IPWireless believes that by the end of 2004, it will have commercial deployment launches or agreements for commercial deployment in a dozen or more countries with a total population of over 340 million.

Most of these deployments are with major wireless operators. Holders of spectrum for UMTS TDD around the world include some of the largest telecom operators in the world. IPWireless, as a founding member of the UMTS TDD Alliance, is closely watching and supporting the efforts of other vendors and operators to deploy UMTS TDD in other countries. There are currently more than forty members in the Alliance.

DISCUSSION

A. TDD Is a Better Technology than FDD for High Data Rate Wireless Broadband Access; TDD Has Thus Become the Preferred Technology for High Data Rate Wireless Broadband Access.

Comparative evaluations of available wireless broadband access technologies conducted throughout the world have repeatedly reached the same conclusion: TDD is a superior technology for the provision of high data rate wireless broadband access. This conclusion has been manifested by the technology choice of operators in numerous countries. Reasons for the selection of TDD technology include:

a. The fact that most recent state-of-the art development work has been focused on TDD technologies
b. TDD's superior capability to operate in relatively small channel allocations, and in those not requiring paired spectrum
c. Adjustable uplink / downlink symmetry to suit actual Internet traffic patterns
d. Higher spectral efficiency as a result of (b) above
e. Ability to take advantage of the reciprocal nature of the radio channel with TDD, e.g. uplink measures can be used to determine parameters for downlink transmission and vice versa

f. Lower cost, smaller CPE due to not requiring duplex filter
g. Lower average CPE transmit power due to the duty cycle of TDD

The superiority of TDD relative to FDD is evident in the relevant measures of system performance. For example, IPWireless UMTS TDD delivers *average* sector data throughput of more than 6 Mbps in some configurations, compared with only 800 kbps for FDD W-CDMA, and 1.3 Mbps for a proprietary FDD OFDM technology.

The commercial success of TDD is evidence of its competitive performance. For example the IPWireless system operated by Woosh Wireless in New Zealand is gaining 40 - 60% of new subscribers in its coverage area, against a strong incumbent DSL offering.

B. The Introduction of High Data Rate Wireless Broadband Access In The U.S. Has Been Seriously Delayed By The Absence Of Usable TDD Spectrum.

Although UMTS TDD is rapidly becoming the preferred technology for high data rate wireless broadband around the world, the U.S. is far behind. There is one main reason for this. The Commission has not allocated and licensed a sufficient amount of spectrum usable for any TDD technology including, but not limited to, UMTS TDD. IPWireless submits that the allocation of sufficient suitable spectrum for TDD is closely correlated to the commercial introduction of wireless wide area[4] high data rate broadband in a country. All the leading companies in the world currently supplying commercially available high data rate wireless broadband access technologies have chosen TDD rather than FDD. The principal providers are

[4] By "wide area" IPW means technology fully capable of providing service throughout large urban and rural areas, like today's cellular and PCS networks. By this definition, IEEE 802.11 (aka Wi-Fi) is not currently a wide area technology.

IPWireless, Navini, NextNet and ArrayComm, all U.S. companies.[5] Each of these suppliers has chosen TDD over FDD for high data rate wireless broadband for a variety of technical reasons, including more efficient handling of asymmetric transmissions characteristic of interactive data exchange. Internationally, each and every commercial deployment of high data rate wireless broadband to date has been based upon TDD. In the absence of a suitable allocation of spectrum for TDD operation, high data rate wireless broadband is absent from the U.S.

A further reason for the lack of high data rate wireless broadband deployment in the U.S. can be found in the Commission's relatively liberal rules governing initial construction and service deployment on paired spectrum held by operators in the U.S. In the cellular and PCS bands, there are large rural areas of the country where surplus licensed cellular and PCS spectrum exists in quantities far in excess of the needs of licensed cellular and PCS operators for present or future provision of traditional commercial mobile radio service ("CMRS") offerings. However, current Commission rules do not provide a sufficient incentive for the incumbent licensees to put this spectrum to immediate use for the deployment of advanced wireless broadband, or to make the spectrum available to others for the provision of such services.

Similarly, three channels in the lower 700 MHz band (channels 54 and 59 licensed on a paired basis as Block D and channel 55 licensed on an unpaired basis as Block C) have been auctioned. This spectrum could be used in many areas of the country for wireless broadband given the absence of adjacent channel and co-channel TV transmissions throughout broad

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[5] While all suppliers of TDD wireless broadband technology are U.S. companies they have had to go internationally to introduce wireless broadband access, with few U.S. installations. This is a direct result of the allocation of significant usable TDD spectrum abroad, in contrast to the lack of availability of suitable spectrum in the U.S. The situation is analogous to the early evolution of the cellular radio industry where cellular, a U.S. invention, was first deployed in Scandinavia due to protracted delays in the allocation and licensing of cellular spectrum in the U.S.

geographic regions.[6] However, this has not occurred because there are relaxed construction deadlines for channels 54, 55 and 59.

In the MMDS and ITFS band between 2500-2690 MHz, deployment of service has been delayed for another reason. The construction requirements have been frozen pending the final adoption of a new band plan and new rules to be promulgated by the Commission in the pending rulemaking proceeding, WT Docket No. 03-66. Given the uncertainty as to whether the Commission will adopt the package of proposed rules advocated by a coalition of interested parties, or make some changes in response to comments filed in WT Docket 03-66, operators are understandably hesitant to deploy any new services, including TDD wireless broadband, even where they could under do so under existing rules permitting the licensing of two-way services. Operators are engaged in trials in limited geographic areas, but operators and investors are unwilling to assume the financial risks inherent in major early deployments of wireless broadband in the MMDS and ITFS band while such crucial details as channel bandwidths and emission masks are not finally resolved. Changes in the band plan or technical rules could lead to rapid obsolescence of installed equipment.

The paucity of suitable spectrum for licensed TDD wireless broadband in the United States stands in marked contrast to the situation internationally. In large portions of Europe and Asia, as well as in some portions of Africa, licenses for TDD spectrum have been awarded, with reasonable construction requirements encouraging operators to rapidly deploy high data rate broadband wireless access services.

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[6] IPW's analysis shows one or more of channels 54, 55 and 59 to be free of co-channel and adjacent channel interference with TV broadcasts in most rural areas of the U.S. and many cities, including top 50 cities. But for the relaxed construction requirements, these channels could be used to provide TDD wireless broadband service.

C. The Growth Of Wi-Fi Reflects In Part The Absence Of Usable TDD Spectrum.

In the U.S. the growth of Wi-Fi to provide high data rate wireless access has been very rapid. "Hotspots" are being deployed around the U.S., covering airports, coffee shops, college campuses, and industrial/business sites. Wireless ISPs and others are seeking to use a variety of technologies to extend the range of Wi-Fi to provide service over greater distances using unlicensed spectrum. Recently the Wi-MAX Forum has been launched with broad company participation. The purpose of the Wi-MAX Forum is to develop, over the next several years, wide-area and portable equivalents to Wi-Fi, and eventually mobile broadband.[7]

Internationally, the situation is somewhat different. While Wi-Fi has grown and is growing, much of the immediate focus for wide area, and rural, high data rate wireless broadband access is on licensed spectrum. TDD licenses were granted in most developed countries in parallel with the adoption of rules for unlicensed spectrum use. The roughly simultaneous adoption of rules for licensed TDD services and unlicensed broadband created a level playing field, giving supporters of unlicensed Wi-Fi and operators with licensed TDD spectrum an equal opportunity to deploy and test the marketability of their respective offerings. Because of early successes in such head-to-head tests, TDD products are already commercially available for the deployment of wide area high data rate wireless broadband. As a result, licensed TDD rather than unlicensed Wi-Fi is now being deployed in additional countries to meet the immediate needs of consumers and businesses for wide area wireless broadband access, with Wi-

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[7] As previously noted, UMTS TDD equipment is already commercially available and being deployed. UMTS TDD is several years ahead of WiMAX. The test and measurement procedures for WiMAX certification are scheduled to be completed by the end of this year, and product will begin shipping in 2005 at the earliest. *See* WiMAX Forum News Release dated April 26, 2004. (http://www.wimaxforum.org/news/press_releases) last visited June 3, 2004.

Fi serving as a complementary technology providing coverage in indoor and campus environments. Consumers have benefited from the combined deployment of local Wi-Fi and TDD wide area high data rate wireless broadband, and both technologies are growing.

In the U.S. there has not been a similar level playing field. In the absence of adequate usable TDD spectrum, and the consequent absence of TDD wireless broadband in the market, Wi-Fi has grown rapidly to fill the gap in service created by the absence from the U.S. market of TDD wireless broadband. Consider how the situation would have evolved in the U.S. had a level playing field existed, with adequate usable TDD spectrum allocated and licensed in the U.S. at the same time as it was allocated and licensed internationally. National or large regional TDD wireless broadband networks would now be in the process of being deployed in the U.S., and American consumers and businesses would not be stretching the limits of Wi-Fi or waiting for Wi-MAX to meet the need for wide area wireless broadband access.

IPW believes the rapid rate of deployment of Wi-Fi within the U.S., as well anticipated future expansion of Wi-Fi to provide wide area coverage has, to a substantial degree, been artificially created by the lack of sufficient usable spectrum for TDD wireless broadband access technologies. The U.S. government is to be congratulated on its success in promoting the adoption of Wi-Fi, but policy makers should realize that this success has come at a price. While the U.S. government has devoted substantial resources to the promotion of unlicensed services, it has devoted virtually no attention to the prospects for TDD wireless broadband, and has neither allocated nor licensed sufficient quantities of unpaired spectrum suitable for high data rate wireless broadband. The result has been a substantial and continuing delay in the advent of wide area wireless broadband service in the U.S.

The Commission correctly perceives that the market demand for wireless broadband access exceeds the current supply, and has taken significant strides to make more spectrum available for unlicensed use in various portions of the spectrum, including 5 GHz, and to promote the use of other low power and typically unlicensed technologies such as ultrawideband.[8] Meanwhile, other nations have adopted more balanced spectrum policies, giving significant attention to the complementarity of wide area licensed wireless broadband services, particularly the high data rate services presently available exclusively via TDD solutions. If the Commission's objective of bringing a wireless "third pipe" into homes and businesses across America is to be attained, the best way to achieve that objective is to follow the lead of numerous developed and developing nations by allocating and licensing substantial quantities of unpaired spectrum below 3.5 GHz for the deployment of commercially available high data rate wireless broadband. IPWireless submits that it is time for the Commission to devote to licensed TDD technologies some of the energy and resources that it has given over the past several years to Wi-Fi and other unlicensed broadband technologies.

The foregoing does not mean IPW is unsupportive of Wi-Fi. IPW views Wi-Fi as complementary to high data rate wireless broadband technology. IPW and other TDD companies provide products that incorporate Wi-Fi, allowing the user to access TDD for wireless broadband access outside of areas served by Wi-Fi while using Wi-Fi within "hotspots" and campus environments where Wi-Fi is available. Both UMTS TDD and Wi-Fi are commercially available technologies for delivery of wireless broadband access, and the two technologies work

[8] As additional examples, the Commission has proposed to make 3650-3670 MHz available for unlicensed use and, on May 13, 2004, creatively proposed rules to allow that unoccupied TV channels to be made available for low power unlicensed use.

well together. Ubiquitous availability of high data rate wireless access services is best achieved by encouraging the simultaneous deployment of TDD and Wi-Fi.

D. In Nations Where Adequate, Usable TDD Spectrum Is Available, Wide Area Wireless Access Is Being Deployed.

In Europe, license awards for the provision of 3G services included a combination of paired spectrum for W-CDMA (FDD) and unpaired spectrum for UMTS TDD. Also, in much of Europe, additional spectrum has been allocated, and is currently usable for TDD on a wide area basis, at 3.4 GHz in most countries and at 2.5 GHz in Germany. The result has been that AirData is deploying, starting in Stuttgart, a national TDD high data rate wireless broadband access system across Germany. In the U.K., UK Broadband (PCCW) is deploying a national system. In Portugal, a national system is being deployed by Optimus and Clix (FT/Orange affiliates). In two other European countries agreement has been reached but not announced to deploy national systems. And in several other countries in Europe trials are occurring that IPW believes will result in national systems.

In Mexico and Canada TDD wide area high data rate wireless broadband access systems are being deployed on frequencies in the 2.5 GHz band. In both of these countries the 2.5 GHz band is free of the fractionalization and interference issues that plague the U.S. 2.5 GHz band.[9] In Canada, two national TDD systems are being deployed and, in Mexico, two large regional systems are being deployed, which together cover most of the country.

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[9] The issue for TDD is adequate usable frequency. The 2.5 GHz band in the U.S. not presently usable, as it is subject to overlapping license areas, an interleaved channel plan, cumbersome site by site licensing, outmoded interference protection criteria and other factors making it unusable for nearly any operator to use for the deployment of wide area wireless broadband access networks.

In South Africa, Sentech is deploying a national TDD system. This system now covers seven cities, including Johannesburg, Cape Town and Durban.

In Asia, two national deployments are underway in Malaysia. Commercial trials are underway in Singapore, where TDD allocations already exist in the 3G IMT-2000 band, and the Government has announced large additional TDD allocations in the 2.3 and 2.5 GHz bands. In Japan, the Government is preparing to allocate spectrum for TDD services in the IMT-2000 band, and major trials of IPWireless mobile technology are underway with the major DSL and fixed line carriers, Yahoo! Broadband and NTT.

In New Zealand, a national TDD system is in commercial service. It is providing service in cities, as well as in rural areas (the latter as part of the government's rural broadband initiative).

In Australia, IQ Networks is providing commercial service using IPWireless technology on a regional basis in second tier cities that are underserved by DSL. The Australian government has encouraged this deployment by awarding licenses for TDD IMT-2000 spectrum free of charge (without the usual auctions) in underserved areas. In addition, two operators in Sydney are deploying wireless broadband access systems using proprietary TDD technologies.

IPW believes that if adequate, usable TDD spectrum had been made available in the U.S. at the same time as in the foregoing countries, a national, or several large regional high data rate TDD wireless broadband networks would now be in place or being deployed.

E. The Approaches Currently Used to Award Spectrum Licenses Have Slowed the Introduction of Broadband Wireless Access in the U.S.

Question 4 of the Public Notice poses the question 4 of whether the U.S. method for determining access to spectrum has affected the development of wireless technologies. The answer is clearly "Yes."

In the U.S., the Commission is currently required by statute to use auctions to award licenses for the use of spectrum whenever there are competing applications.[10] The early success of spectrum auctions in raising revenues for the general fund of the U.S. Treasury has, from time to time, given rise to substantial pressure on the Commission, originating directly from Congress but with significant input from the Office of Management and Budget in the Executive Branch, to design and conduct spectrum auctions that will meet or exceed certain revenue goals. While auctions, as a rule, have proven superior to either lotteries or "beauty contests," auctions have several unfortunate consequences that have adversely affected the development of wireless broadband:

- The political pressure to conduct auctions to deliver a minimum number of dollars for a given frequency block provides an incentive for the Commission to find and auction spectrum for FDD rather than TDD. FDD was developed first and is widely deployed by major operators.[11] Because FDD is a known technology, and because major operators have already spent billions of dollars on FDD infrastructure and licenses, it is only natural that operators have, to date, expressed a willingness to pay premium prices for FDD spectrum, as compared with the prices they would offer for TDD spectrum (given that TDD has not yet been widely deployed in the U.S. on a commercial basis). The consequences of the auction process and its (probably unintentional) bias toward FDD are seen in

[10] IPWireless recognizes that there are certain exceptions to the auction requirement, but those exceptions are, for the most part, not relevant to the present discussion.

[11] TDD could not be developed until breakthroughs occurred in signal processing. These only occurred in the late 1990's, well after the advent of FDD cellular and PCS.

the recent allocation of the 1710-1755 and 2110-2155 MHz spectrum. The FCC designated the entirety of this spectrum for FDD, making no provision for TDD. This contrasts with Europe where UMTS TDD spectrum was allocated along with W-CDMA (FDD) spectrum.

- The auction process favors established technologies (*i.e.* FDD) over emerging ones (*i.e*. TDD); this was true even for broadband PCS, where the successful bidders largely eschewed the creative technologies they had espoused in the rulemaking proceedings and decided, instead, to deliver new and improved versions of cellular service. It is no less true today where, as here, it is the more recently developed UMTS TDD technology, which offers a clear path to realization of the Commission's wireless broadband goals, is in jeopardy of being neglected. In this manner the auction process, as it has existed to date, impedes the attainment of the Commission's broader spectrum policy goals.[12]
- A third unfortunate consequence of the statutory auction requirement is that it provides an incentive for the Commission to provide spectrum for broadband wireless services through allocation of additional unlicensed spectrum rather than licensed spectrum. The allocation of unlicensed spectrum rather than licensed spectrum avoids the time delays and cumbersome procedures associated with auctions; it is natural that the Commission would turn to the allocation of unlicensed spectrum in the hope it will meet its goals for early availability of wireless broadband.

To correct the inherent auction bias toward FDD and toward unlicensed spectrum, IPW suggests that the Commission consider how it can design a spectrum allocation policy best able to achieve its overall policy objective of promoting the widespread availability of high data rate wireless broadband access. In doing so, the Commission should learn from the experiences of other nations that have achieved a balanced allocation of paired, unpaired and unlicensed spectrum. To achieve such a balance, the Commission should immediately focus on identifying and auctioning one or more substantial unpaired frequency blocks, exhibiting the same creativity and

[12] It is to be noted that the FDD-centric orientation at the Commission is also supported by the major wireless operators. They are making multi-billion dollar investments in slower data rate FDD technologies such as EV-DO and EDGE, and appear to have little interest in seeing competition in the market from much higher data rate, lower cost TDD technologies.

openness to innovation that it has recently shown in identifying additional opportunities for broadband technologies using unlicensed spectrum.

F. Recommendation 1: TDD Frequency Allocations In The U.S. Should Correspond To International Allocations To Allow Global Roaming.

In previous submissions in the Advanced Wireless Services rulemaking, IPWireless urged the Commission to allocate TDD spectrum in bands that would allow for roaming between the U.S. and those countries that have allocated all or a portion of the 1900-1920 MHz and 2010-2025 MHz bands for UMTS TDD operation. IPW's previous submissions on this issue are incorporated by this reference and will not be repeated in detail here.[13] In summary, IPWireless recommended that the Commission designate 1910-1920 MHz and 2020-2025 MHz for TDD operation in order to allow for international roaming, together with ten MHz from the 2155-2180 MHz band to provide sufficient spectrum for up to five operators with 5 MHz each.

G. Recommendation 2: Construction Rules Should be Tightened to Promote the Wider Availability of Licensed Spectrum for Operators Seeking to Provide Commercial Wireless Broadband Access.

Although the Commission has made significant strides in its efforts to encourage the availability of spectrum on the secondary market, the rules authorizing spectrum manager leasing and *de facto* transfer leasing have only been effective since February of this year.[14] IPWireless

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[13] Letter, dated December 3, 2003, from Larry A. Blosser, Counsel to IPWireless, Inc. to Marlene Dortch, Secretary, FCC, in reference to ET Docket No. 00-258; Notice of Ex Parte Presentation, dated March 26, 2004, reporting on a meeting between representatives of IPWireless and the staff of the Wireless Telecommunications Bureau on that date, filed in both ET Docket No. 00-258 and WT Docket No. 03-66.

[14] Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Memorandum Opinion and Order,* WT Docket No. 00-230, DA 04-239 (WTB, Jan. 30, 2004).

recently reviewed the Commission's Universal Licensing System (ULS) and found that fewer than fifty spectrum leases had been filed electronically as of late May. Although some leases cover multiple licensed facilities, and despite the technical limitations in ULS that may have resulted in some early filers submitting spectrum leases in paper form, it is clear that only a miniscule fraction of the many thousands of licenses currently eligible for spectrum leasing are, as of today, the subject of secondary market transactions.

The slow start on spectrum leasing may be attributable in part to the lack of any clear incentive on the part of incumbent licensees to make spectrum available to potential competitors. The value to an incumbent of keeping spectrum out of the hands of a potential competitor may well exceed, in many cases, the monetary gain to be derived through a spectrum leasing arrangement. Stated differently, the Commission's secondary market may be a very small carrot, in need of a sizeable stick, in the form of more stringent construction and service requirements.

In many rural areas and small towns across the country, the incumbent licensees of cellular and broadband PCS spectrum hold authorizations for more spectrum than they need for the provision of existing or future commercial mobile radio services ("CMRS"). Yet, they are under no significant regulatory pressure either to put that spectrum to effective use for the provision of their own advanced wireless broadband services or to lease the spectrum rights to others. Cellular licensees, one of whom in each market is generally the incumbent wireline carrier and a likely provider of wired broadband access via DSL, are subject to a five-year buildout requirement, as set forth in section 22.947 of the Commission's rules. Licensees holding 30 MHz licenses for broadband PCS spectrum are required to demonstrate coverage of one-third of the population in their licensed service areas within five year and two-thirds population coverage by the end of the initial ten year license term, under Section 24.203. Licensees of

smaller blocks of PCS spectrum can either make a showing of service to one-quarter of the population within five years, or alternatively make a showing of "substantial service" during the initial five-year period, again under Section 24.203. Once these construction requirements are satisfied, the licensees are entitled to a "strong" renewal expectancy. Once the initial construction requirements are met, there is little meaningful incentive for cellular or PCS operators to venture into the comparative "unknown" of wireless broadband deployment, particularly in those instances where wireless broadband would compete with the DSL services offered by the incumbent licensee or its affiliate.

If there were an effective secondary market for currently unused spectrum in the cellular and PCS bands, this spectrum could be used immediately to provide small towns and rural areas in America with wireless broadband access. IPWireless technology is capable of being rebanded to operate in these frequency bands, and the propagation characteristics of the cellular band and the broadband allow for wider area coverage than, for example, the 2.5 GHz MMDS/ITFS band. IPWireless also has an implementation of UMTS TDD technology designed to operate in paired (FDD) spectrum like cellular or PCS, referred to as the "auxiliary downlink" capability. For example, if a PCS or cellular operator in a rural area has 5 MHz of unused uplink and downlink channels, it could put IPW's technology of the unused FDD uplink channels, use the unused downlink channel for IPW's auxiliary downlink and offer high capacity, wide area wireless broadband access. IPW recommends that the Commission commence a rulemaking proceeding to consider whether the current rules for licensed cellular and PCS services are effectively meeting the Commission's statutory mandate to make an efficient nationwide radio service

available to all the people of the United States,[15] and if not, to consider any changes in construction requirements, license renewal procedures, or spectrum leasing policies that may be necessary to achieve that mandate. The Commission may also wish to seek comment on whether, either under its existing statutory authority under Section 309(j) of the Communications Act or under new legislation it might propose to Congress, it could encourage the deployment of broadband wireless access in rural areas or other underserved areas by awarding licenses for limited blocks of unpaired spectrum free of charge, as has been done in Australia.

H. Recommendation 3: The 700 MHz Band Presents Additional Opportunities for the Rapid Deployment of Advanced Wireless Broadband Services.

Portions of the "lower 700 MHz band" (UHF Television Channels 52-59) have already been made available via auction for the provision of fixed, portable and mobile services on a flexible use basis. In Auctions 44 and 49, television Channels 54 and 59 were auctioned as paired spectrum (C Block) in numerous relatively small geographic service areas, and Channel 55, (the D Block) was auctioned on an unpaired basis in six large geographic regions or EAGs. Pursuant to Congressional directives, the remaining spectrum comprising the A, B and E blocks (Channels 52, 53, and 56-58) will not be auctioned until the transition of terrestrial broadcast television to digital television (DTV) is complete or nearing completion. The construction rules governing the lower 700 MHz band were based on the premise that the channels would be unusable across the U.S. until existing analog TV transmissions are relocated from the lower 700 band into the "core" channels (TV channels 2-51) at the completion of the DTV transition.

[15] 47 U.S.C. Section 151.

IPWireless has conducted a preliminary study and analysis of the current occupancy of the band, taking into consideration the current rules for protection of both analog and digital TV stations from co-channel and adjacent channel interference and the technical parameters typical of a UMTS TDD high data rate wireless broadband access system, of which IPW's technology is an example. In many parts of the country, including both large rural areas and many cities, at least one of the two 700 MHz channels within the C Block (either TV Channel 54 and 59) could be currently used for TDD wireless broadband access.[16] In other areas, the unpaired D Block spectrum corresponding to TV channel 55 is similarly available for TDD wireless broadband use. IPW would welcome the opportunity to meet with members of the Wireless Broadband Access Task Force and other interested Commission staff to share the detailed results of its analysis.

If, as IPWireless believes, there are wide areas of the country (both rural and urban) that could be served by wireless broadband without harmful interference to either analog or digital television broadcasts, the consequences are two-fold:

- The Commission should consider the adoption of measures it to encourage licensees of the lower 700 MHz C and D Blocks to put their licensed spectrum to use for the provision of UMTS TDD wireless broadband (or other non-interfering services) immediately, rather than waiting until the DTV transition is complete to begin deploying service.
- The Commission should reevaluate the ability of the remaining lower 700 MHz channels to support non-interfering services, and if necessary seek relief from Congress to accelerate the timetable for the auction and commercial use of the remaining channels, including but not limited to unpaired TV channel 56.

[16] Note that if the availability of spectrum were viewed as dependent on the availability of paired spectrum (under the traditional FDD-centric approach), this would limit deployment opportunities to those regions where both channels 54 and 59 are available for deployment. In that case, the opportunity is much more limited, if it exists at all.

I. Recommendation 4: The Revised Rules for the MMDS and ITFS Bands (2500-2690 MHz) Should Include Firm but Reasonable Construction Deadlines and Service Requirements

In Comments filed September 8, 2003 in WT Docket No. 03-66 and clarified in reply comments filed on October 23, 2003, both of which are hereby incorporated by reference, IPWireless noted that the spectrum in the 2500-2690 MHz band has lain fallow for far too long, and recommended that the Commission adopt a series of construction milestones and service rules, generally modeled after the MDS BTA rules, to be rigorously enforced with respect to all providers of commercial services in the band. IPWireless proposed a modified set of construction and service obligations for ITFS licensees leasing excess spectrum capacity to commercial operators. IPWireless continues to believe that these or similar requirements are necessary to avoid a continuation of the historic pattern of underutilization of spectrum in the MMDS and ITFS bands.

J. Recommendation 5: Sufficient Spectrum Usable for the Deployment of UMTS TDD Wireless Broadband Access Should Be Made Available As Soon As Possible.

In previous sections of these comments, IPWireless has identified several possible paths that the Commission can take to create a favorable environment for the deployment of UMTS TDD wireless broadband access, on a substantially equal footing with traditional licensed FDD services and complementing local broadband services based on Wi-Fi and similar technologies. For example, as described in Section G, above, IPWireless urges the Task Force to recommend that the Commission carefully examine whether the lower 700 MHz channels generally (and, in particular, the unpaired D and E Blocks corresponding to TV Channels 55 and 56) can be made available either immediately or in the very near future for the deployment of UMTS TDD technology in wide areas of the U.S. Similarly, as noted above in Section F, IPWireless has

identified the need for at least 25 MHz of spectrum in the 1910-1920 MHz, 2020-2025 MHz and 2155-2180 MHz "Advanced Wireless Services" bands to accommodate international roaming and the provision of UMTS TDD service in the U.S. by multiple operators.[17] IPWireless, as a supporter of the Coalition Proposal for the MMDS and ITFS spectrum and an active participant in WT Docket No. 03-66, has proposed technical rules and alternative band plans to help achieve the prompt and flexible deployment of a wide range of wireless broadband access services.

The hour is growing late. Countries in Europe, Asia and elsewhere in the Americas have moved ahead of the United States to develop spectrum allocation policies and to make spectrum available in ways that encourage the balanced deployment of FDD and TDD technologies in a mix of licensed and unlicensed spectrum. As a result of delays at the Commission, IPWireless and other U.S.-based developers of TDD technologies have found themselves pursuing opportunities elsewhere, while U.S. consumers await the delivery of wireless broadband access, the long-awaited "third pipe" that promises to spur further innovation through market competition.

[17] Written Ex Parte Presentation in ET Docket No. 00-258 dated December 3, 2003, from Larry A. Blosser, Counsel to IPWireless, Inc. to Marlene Dortch, Secretary, FCC.

CONCLUSION

IPWireless respectfully submits that no new communications technology other than wireless broadband access offers greater promise for the economy of America and the welfare of its people. The fastest and simplest way to facilitate the deployment of wireless broadband access is to provide adequate, usable spectrum for TDD. TDD wireless broadband access technology is commercially available now and already offers the low cost, wide area (including rural) coverage the Commission is seeking. In other countries TDD spectrum has been allocated and licensed and the benefits are already being seen in national wireless broadband access deployments. The Commission can achieve the same benefits in the U.S. by quickly allocating at least 25 MHz in the Advanced Wireless Service bands between 1900-2185 MHz for TDD, by encouraging deployment of non-interfering UMTS TDD technologies in the already auctioned lower 700 MHz band (Channels 54, 55 and 59), by considering accelerated licensing of the remaining 700 MHz channels, and by moving quickly to finalize rules for the 2.5 GHz band to facilitate flexible use of TDD in substantial parts of that spectrum.

Respectfully submitted,
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